

Claims

We claim:

1. A semiconductor module, comprising:

a semiconductor chip;

a substrate; and

an interposer structure electrically connecting the semiconductor chip to the substrate, wherein the interposer structure includes metallurgical through connections having a predetermined shape.

2. The semiconductor module of claim 1, wherein the interpose member comprises an elastomeric, compliant material that includes the metallurgical through connections.

3. The semiconductor module of claim 1, wherein the predetermined shape is selected from the group consisting of spherical, elongate, c-shaped, s-shaped and ellipsoid.

4. The semiconductor module of claim 1, further comprises support posts positioned adjacent the interposer structure.

5. The semiconductor module of claim 4, wherein the support posts support a heat spreader over the semiconductor chip.

6. The semiconductor module of claim 1, further comprising underfill for sealing the interposer structure between the semiconductor chip and the substrate.

7. The semiconductor module of claim 1, wherein the metallurgical through connections of the interposer structure electrically connect an under bump metallization of the semiconductor chip to a top surface metallization of the substrate.

8. The semiconductor module of claim 7, wherein the metallurgical through connections are soldered to at least one of the under bump metallization or the top surface metallization.

9. The semiconductor module of claim 1, wherein the metallurgical through connections are coated with gold.

10. A semiconductor module, comprising:

a semiconductor chip having an under bump metallization;

a substrate having a top surface metallization; and

an interposer structure electrically connecting the under bump metallization to the top surface metallization, wherein the interposer structure comprises an elastomeric, compliant material that includes metallurgical through connections having a predetermined shape.

11. The semiconductor module of claim 10, wherein the predetermined shape is selected from the group consisting of spherical, elongate, c-shaped, s-shaped and ellipsoid.

12. The semiconductor module of claim 10, further comprises support posts positioned adjacent the interposer structure for supporting a heat spreader over the semiconductor chip.

13. The semiconductor module of claim 10, further comprising underfill for sealing the interposer structure between the semiconductor chip and the substrate.

14. The semiconductor module of claim 10, wherein the metallurgical through connections are soldered to at least one of the under bump metallization or the top surface metallization.

15. The semiconductor module of claim 10, wherein the metallurgical through connections are coated with gold.

16. A method for forming a semiconductor module, comprising:

embedding metallurgical through connections within an elastomeric, compliant material to form an interposer structure; and

positioning the interposer structure between a semiconductor chip and a substrate to electrically connect the semiconductor chip to the substrate.

17. The method of claim 16, wherein the metallurgical through connections electrically connect an under bump metallization of the semiconductor chip to a top surface metallization of the substrate.

18. The method of claim 17, further comprising soldering the interposer structure to at least one of the under bump metallization or the top surface metallization.

19. The method of claim 16, further comprising positioning support posts adjacent the interposer structure to support a heat spreader over the semiconductor chip.

20. The method of claim 16, further comprising sealing the interposer structure between the semiconductor chip and the substrate with underfill.